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| 10/762,839 | 01/21/2004 | Srikrishna Talluri | | 5856 |

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SRIKRISHNA TALLURI
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| EXAMINER |
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WALTER, CRAIG E

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| ART UNIT | PAPER NUMBER |
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2188

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 04/26/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/762,839 | Applicant(s) TALLURI, SRIKRISHNA | |
| | Examiner Craig E. Walter | Art Unit 2188 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 4-23 are pending in the Application.

Claims 4-23 are new.

Claims 1-3 are cancelled.

Claims 4-23 are rejected.

Response to Amendment

2. Applicant's amendments and arguments filed on 3 January 2007 in response to the office action mailed on 29 June 2006 have been fully considered, but they moot in view of the new ground(s) of rejection.

Drawings

3. The drawings were received on 29 November 2006. These drawings are deemed acceptable.

Claim Objections

4. Claims 4-23 are objected to because of the following informalities:

As for claim 4, the phrase "the nodes" as recited on line 8 of the claim should be changed to "all or selected nodes" to properly establish antecedent basis for the phrase. As similar objection applies to this claim for the phrase "said nodes" as recited in lines 11 and 13. Additionally, the phrase "said shared

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storage space” as recited on the final line of the claim should be changed to “a shared storage space” to properly establish antecedent basis for the phrase.

Lastly, the phrase “said data written” as recited on lines 12 of the claim should be changed to “data written” to properly establish antecedent basis for the phrase.

More specifically, data being actually written to the central file server or server group is not previously set forth within the claim (rather the method only *enables* it to be written). A similar objection applies to claims 5-9 (line 1).

As for claim 6, the phrase “the nodes” as recited on line 1 of the claim should be changed to “all or selected nodes” to properly establish antecedent basis for the phrase.

As for claim 7, the phrase “the network” as recited on line 3 should be changed to “the network system” to properly establish antecedent basis for the phrase.

As for claim 10, the phrase “the high data availability” as recited on line 1 should be changed to “high data availability” to properly establish antecedent basis for the phrase.

Similar objections to the ones addressed in claim 4 apply to claims 11, 18 and 19.

Similar objections to the ones addressed in claim 5-10 apply to claims 12-17 and 20-23.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As for claims 4-10, Applicant has clearly set forth claims directed to a process (i.e. method for creating and operating a communicatively coupled network system), however fails to set forth exclusively a set of process steps which clearly define the claimed invention, hence rendering the claims indefinite. For example, the first recitation of claim 4 seems to be directed to an apparatus (referring to the storage capacity of all or selected nodes, rather than a process directed to segmenting the capacity). Examiner suggests the following language in order to more clearly define the method of claim 4:

A method for creating and operating a communicatively coupled network system with effective utilization of data storage capacity on nodes in said network system, wherein said method comprises:

segmenting the storage capacity on all or selected nodes into non-sharable and shared storage capacity based either on a percentage of 'available/unused' or 'total installed' storage capacity or as a specific amount of unused or installed storage capacity on said all or selected nodes;

enabling all or selected nodes to write data to a central file server or server group after utilization of available storage space on the all or selected nodes or server group, and;

writing data onto said central file server by stripping said written data across a shared storage space on all or selected nodes in said network system.

Claims 5-10 should be similarly corrected by drafting them such that they recite a step or set of steps that further limit one of the previously set forth steps, or adds a new step to the original three set forth in claim 4.

As for claims 11-17, Applicant clearly sets forth claims directed to a system (i.e. system for creating and operating a communicatively coupled network system), however fails to limit the claims to system (i.e. recites a method step within the claimed system – see line 9), hence rendering the claims indefinite. Examiner suggests the following language in order to more clearly define the system of claim 11:

A system for creating and operating a communicatively coupled network system with effective utilization of data storage capacity on nodes in said network system, wherein said network system comprises:

- storage capacity on all or selected nodes that is segmented into non-sharable and shared storage capacity based either on a percentage of 'available/unused' or 'total installed' storage capacity or as a specific amount of unused or installed storage capacity on said all or selected nodes;

- a central file server or server group in which data may be written to by all or selected nodes after utilization of available storage space on said all or selected nodes or server group, and;

- a shared storage space defined by said all or selected nodes in said network system, in which said data is stripped across said shared storage space on all or selected nodes in said network system.

Claims 12-17 should be similarly corrected by drafting them such that they recite a structural element or elements that further limit one of the previously set forth structural elements, or adds a new structural element to the original three set forth in claim 11.

Similar rejections apply to claims 18 and 19 as discussed in claim 4 above.

Similar rejections apply to claims 20-23 as discussed with claims 5-10 above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 4-7, 9-14, 16-21 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hartman et al. (The Zebra Striped Network File System. ACM Trans. on Computer Systems, August 1995, pages 274-310, 13 (3), ACM Press. USA), hereinafter Hartman.

As for claims 4, 11, 18 and 19, Harman teaches a method (and system) for creating and operating a communicatively coupled network system with effective utilization of data storage capacity on nodes in said network system wherein:

the storage capacity on all or selected nodes is segmented into non-sharable and shared storage capacity based either on the percentage of 'available/unused' or 'total installed' storage capacity or as a specific amount of unused or installed storage capacity on the nodes (referring to Fig. 5, page 282 – the nodes include clients and storage servers. The total system storage capacity of the network system (clients, storage servers and file manager/stripe cleaner) includes the capacity of each of the storage servers and the cache in the client(s). The cache within a particular client device (page 286, section 5.2 lines 1-11) constitutes non-sharable storage capacity since the capacity of that

memory is not available to the central file server (storage servers and the file manager/stripe cleaner), rather the *data* is eventual made available to the storage server. The combined capacity of all of the storage servers is shared among all of the servers (and accessible via the file manager/stripe cleaner) within the central file server; hence those locations constitute "shared capacity". Since the client's cache is a fixed size, and the storage servers have finite capacity, the non-sharable capacity will always be some "percentage of total installed storage capacity" – see also page 283, section 4.2, lines 1-9);

said method further enables all or selected nodes to write data to a central file server or server group after utilization (as in claims 4, 11; and after a predetermined storage capacity threshold as in claim 19 (i.e. cache is full)) of available storage space on the said nodes or server group, and said data written onto said central file server is striped across said shared storage space on said nodes in said network system (once the cache within the client is full, the data is stripped across the storage servers - page 286, section 5.2 lines 1-11).

As for claim 5, Hartman teaches data written to the central file server or server group as being abstracted and displayed as a local file with a pointer to the actual location on the central file server or server group (page 284, section 4.3, lines 1-22 – the file manager abstracts the location of the striped blocks via the use of metadata and pointers).

As for claim 6, Hartman teaches the data sent by the nodes to the central file server or server group as being written with or without parity (Fig. 1, the RAID stripping across the servers contains parity).

As for claim 7, Harman teaches the data written to shared storage as being hatched together into a sequential log and then divided into efficient larger blocks to optimally use the network and I/O subsystem bandwidth (page 275, lines 25-42 – the client stores the data in a sequential log prior to stripping it across the storage servers).

As for claim 9, Hartman teaches the data as being written either at a file level or block level (block level – page 283, section 4.2, lines 1-3).

As for claim 10, Hartman teaches high data availability on all nodes and server groups as being ensured through computed parity and multiple levels of redundancy (page 275, lines 25-42 – the data is stripped by various RAID configurations).

Claims 12-14, 16, 17, 20, 21 and 23 are rejected based on the same rationale as claims 5-7, 9, 10, 5, 7, and 9 respectively.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 8, 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartman (The Zebra Striped Network File System, ACM Trans. on Computer

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Systems, August 1995, pages 274-310, 13 (3), ACM Press. USA) as applied to claim 1, 11 and 19 above, and in further view of Tzelnic et al. (US Patent 5,829,046), hereinafter Tzelnic.

As for claims 8, 15 and 22, though Hartman teaches all of the elements of claims 1, 11 and 19, he fails to specifically teach writing the data to the shared storage during off-peak system usage times based on statistics provided by network bandwidth meters and I/O subsystem capacity.

Tzelnic however teaches an on-line tape backup system using an integrated cached disk array, which provides a means for storing data in a network (col. 2, lines 42-62). More specifically, Tzelnic teaches a system that is capable of monitoring network usage (i.e. capacity and bandwidth) and transferring the data during off-peak times – see col. 25, lines 55-67 and claim 26.

It would have been obvious to one of ordinary skill in the art at the time of the invention for Hartman to further include Tzelnic's on-line tape backup system into his own Zebra stripped network file system. By doing so, Hartman would have a more efficient means of transferring the data from the clients to the storage servers by waiting until an off-peak time, in which the network is not as heavily loaded, and bandwidth is not as highly in demand as taught by Tzelnic in col. 25, lines 55-67.

Response to Arguments

8. Applicant's arguments with respect to claims 4-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

10. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig E. Walter whose telephone number is (571) 272-8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


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13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Craig E Walter
Examiner
Art Unit 2188

CEW



HYUNG SONGH
SUPERVISORY PATENT EXAMINER

4-24-07